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official translation
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Guidelines for the Use of Prussic Acid (Zyklon)
For Destruction of Vermin (Disinfestation).**I. Properties of Prussic acid:**

Prussic acid is a gas that is released by evaporation.

Boiling point: 26° C.
Freezing point: -15° C.
Specific weight: 0.69.
Vapor density: 0.97 (Air = 1.0).
Liquid form evaporates easily.

Liquid form: clear and colorless as water.
Smell: unique, bitter-sweet.
Powerful ability to penetrate.
Prussic acid is water-soluble.

X **Danger of explosion:**

75 g. Prussic acid in 1 cbm. air. (Normal application is ca. 8 - 10 g. per cbm., so not explosive). Prussic acid should not be brought into contact with open fire, glowing metal wire, and so forth. It burns slowly and loses its potency completely. (It produces carbonic acid, water and azote.)

Toxicity to warm-blooded animals:

Prussic acid acts without notice, therefore it should be considered *highly poisonous* and *highly dangerous*. Prussic acid is one of the most powerful poisons. 1 mg. per kg. - body weight is enough to kill a man. Children and women are usually more sensitive than men. A very small quantity of Prussic acid does not harm men, even with constant breathing. Birds and fish are very sensitive to Prussic acid.

Toxicity to insects:

The effect of Prussic acid on insects depends less on temperature than is the case with other gases; that is, it even works at cold temperatures (even down to -5° C). For many species, particularly bedbugs and lice, the eggs are more sensitive than the imagos.

Toxicity to plants:

The degree of toxicity depends on the the amount of vegetation on the plant. Plants with hard leaves are less sensitive than those with soft leaves. Mold and dry rot are not killed by Prussic acid.

Prussic acid does not kill bacteria.

II. Forms in which Prussic acid is used:

Zyklon is a mixture of Prussic acid and an irritating agent absorbed in a substrate. The substrate may be

wood disks, a granular red-brown material ("Diagriess") or small blue cubes ("Erco").

The irritating agent is used as a warning method, and has the additional advantage that it stimulates the breathing of insects. Release of Prussic acid and the irritating agent by simple evaporation. *Zyklon will keep for 3 months.* Use damaged cans first. *Always use up the contents of a can completely.* Liquid Prussic acid harms polish, varnish, paints, and so on - gaseous Prussic acid will not. The toxicity of Prussic acid is not affected by the irritating agent, but the danger is reduced.

Zyklon can be made harmless by burning.

III. Symptoms when poisoned:

1. Slight poisoning:

Dizziness, headache, vomiting, discomfort, and so on. These symptoms will disappear if one quickly goes out into fresh air. Alcohol reduces the resistance to Prussic acid gassing - do not drink alcoholic drinks before gassing.

Administer: 1 tablet Cardiazol or Veriazol to prevent heart trouble, another tablet 2 to 3 hours later if need be.

2. Severe poisoning:

The victim collapses suddenly and is unconscious. First aid: fresh air, remove gas mask, loosen clothing, assist breathing.

Lobelin intramuscular 0.01 g.

Camphor injections are forbidden.

3. Poisoning through the skin:

Symptoms as for 1. Treatment also the same.

4. Stomach poisoning:

Treat with:

Lobelin 0.01 g. intramuscular

iron sulfate vitriol

calcinated magnesia.

IV. Protection against gas:

When gassing with Zyklon use only special filters, such as filter insert "J" (blue-brown) made by the Auergesellschaft, Berlin, or the Drägerwerke, Lübeck.

If gas gets into the mask, leave the building immediately and change filters, then test the mask and mask seating for tightness. The filter insert is exhausted when gas can get into the mask. With filter "J", first go into the open air for about 2 minutes, so that moisture from the breath can build up in the filter insert.

The filter should never be changed in a gas-filled room.

V. Personnel:

For every disinfestation, a disinfestation team will be used, consisting of at least 2 men. The gassing

leader is responsible for the gassing. His duties include particularly inspection, aeration, giving the all-clear and safety measures. The gassing leader should appoint a deputy in case he is absent. The orders of the gassing leader should be obeyed without hesitation.

Untrained personnel or trained personnel without a certificate should not be used for gassing operations. Such persons also should not be allowed to enter a room filled with gas. The gassing leader should know where his personnel are at all times. All personnel should be able to prove at all times that they possess official authorization to use Prussic acid for disinfestation of pests.

These guidelines should be followed exactly in all cases.

VI. Equipment:

Every man should have with him at all times:

1. His own gas mask.
2. At least 2 special packets for use against Zyklon Prussic acid.
3. The manual "First Aid for Prussic Acid Victims".
4. A copy of the work order.
5. Authorization certificate.

Every disinfestation team should have with it at all times:

1. At least 3 additional special packets.
2. 1 *Trace gas detector*.
3. 1 Lobelin injection device.
4. Lobelin, 0.01 g. ampules.
5. (Cardiazol), Veriazol tablets.
6. 1 prybar or spike-hammer to open Zyklon cans.
7. Warning posters of the prescribed kind.
8. Sealing material.
9. Paper sheets on which to lay out Zyklon.
10. A flashlight.

All equipment should be kept clean and in working condition. Damage to equipment should be repaired immediately.

VII. Planning a gassing:

1. Will the gassing work?
 - a) Type and situation of the building.
 - b) Nature and condition of the roof.
 - c) Nature and condition of windows.
 - d) Presence of heating shafts, air shafts, holes in the wall, and so on.
2. Determine the kind of pests to be exterminated.
3. Calculate the volume of the space. (Do not rely on plans, make your own measurements. Only measure exteriors, include masonry in the calculations.)
4. Prepare the occupants (Remove house animals, plants, food, undeveloped photographic plates, drinks and tobacco, gas mask filters).
5. Determine openings difficult to seal. (Air shafts, drains, large openings with wooden planking, roofs).
6. Determine necessary safety measures. (Guards, work gangs for sealing).
7. Set the date for the operation and the time needed for evacuation.
8. Make plans for the safety of the neighborhood, if necessary.
9. Notify the authorities.

VIII. Preparation for a gassing:

1. Sealing.
2. Open all doors, wardrobes, drawers, and so on.
3. Spread bedding out.
4. Remove open liquids (left-over coffee, wash-water, and so on).
5. Remove food.
6. Remove plants and house animals (aquariums, and so forth).
7. Remove undeveloped photographic plates and film.
8. Remove dressings for wounds, medications whether open or in packages (especially charcoal).
9. Remove gas mask filters.
10. Prepare to inspect the result.
11. Evacuate the occupants.
12. Collect keys. (All entry door keys.)

IX. Gas concentration and treatment period

depend on

- the type of pest,
- the temperature,
- the degree to which the space is filled,
- the air-tightness of the building.

For inside temperatures of over + 5° C one should ordinarily use 8 g./cbm. Prussic acid.

Treatment period: 16 hours, when no other conditions, such as a closed-in method of construction, permit a shorter period. In warm weather one may reduce the period to 6 hours. When the temperature is under + 5° C the period should be extended to at least 32 hours.

The strengths and treatment periods given above apply to: bedbugs, lice, fleas and so forth, and to eggs, larvae and pupae.

For clothes moths when the temperature is over 10° C, 16 g./cbm. and 21 hours application time.

Flour moths, as for bedbugs.

X. Gassing a building:

1. Check to make sure all persons have left the building.
2. Unpack the Zyklon cases. For each floor, prepare the necessary quantity.
3. Distribute the cans. One man goes into the building, receives and distributes the cans brought to him by the work gang (He puts them by the sheets of paper.)
4. Dismiss the work gang.
5. Deploy the guard; the leader of the gassing team gives them his orders.
6. Check that the sealing and evacuation are complete .
7. Put on all gas protection gear.
8. Open the cans and pour out the contents. Spread the contents out thinly, so that the Zyklon evaporates quickly and the required concentration of gas is reached as soon as possible. The treatment should begin on the highest floor, the cellar should be treated before the first floor if the former has no exit. Rooms already treated should not be entered again, if possible. The treatment should be carried out slowly and methodically. Go slowly on stairways especially. The treatment should be interrupted only in case of emergency.
9. Lock and seal the entry doors (Do n't forget the keyholes) and give the keys to the gassing team leader.

10. On every outside door put up a placard with the inscription: "WARNING: Poison gas — deadly danger — entry forbidden." If necessary, the warning placard should be multilingual. It should show at least 1 clearly visible death's head.
11. All gas protection gear, resuscitation equipment and *trace gas detectors* should be handy. Every member of the gassing team should know where these items can be found.
12. At least 1 member of the gassing team should remain near the building being gassed. The guard should be notified of his position.

XI. Aeration:

Aeration presents a great danger for both participants and non-participants. Therefore it should be carried out carefully and gas masks should always be worn. Aeration should be done in such a way that 1) *gas-free air can be reached in the shortest possible time*, 2) gas flows off to one side, *where there is no danger to non-participants*. When the aeration is difficult, one man with special training should remain with the building to observe the flow of gas.

1. Make sure that no persons not involved with the gassing remain in the vicinity of the building.
2. Post the guards such that they can observe the entrances to the building without being in the way of the flowing gas.
3. Put on gas masks.
4. Enter the building, shut the doors but do n't lock them.
5. First open the windows on the side of the building away from the wind. Aerate one floor at a time. Begin with the first floor and allow a rest of at least 10 minutes after each floor.
6. In each room of the building the hallway doors, connecting doors and windows should be opened. If any windows are difficult to open, wait to open them until after most of the gas has blown away.
7. Planking and other seals that cannot be easily handled should only be removed after most of the gas has blown off.
8. When there is freezing or danger of freezing, be sure that heating systems and water lines do not freeze.
9. Rooms with valuable contents such as clothes storage may be closed as soon as the windows are opened.
10. Make sure that open doors and windows do not close on their own.
11. Seals on chimneys should be removed after the provisional all-clear.
12. Aeration should last at least 20 hours.
13. The guard should remain near the building throughout the aeration.

XII. Provisional all-clear:

A gassed room can be provisionally opened to access as soon as the paper strips used as *trace gas detectors* show a lighter blue than the middle of the reference color scale — windows and doors being kept open. Only aeration and clean-up work can be carried on in provisionally opened rooms. Under no circumstances should anyone rest or sleep in a provisionally opened room. The windows and doors of such rooms should be kept open.

XIII. Clean-up after the provisional all-clear:

1. Removal of remnants of Zyklon from the gassed rooms. Usually they should be sent back to the manufacturer along with cans and cases. The inscription "Poison" should be removed from the cases before they are sent. Moist, wet or dirty remnants, and damaged cans should never be returned. They can be thrown in the trash or on the cinder heap, but should never be dumped into drains.
2. Mattresses, straw mattresses, pillows, upholstered furniture and other such objects should be shaken or beaten in the open for at least one hour under the supervision of the gassing team leader or his deputy (in rainy weather at least two hours in the hallway).
3. The stuffing of straw mattresses should be replaced, if possible. The old stuffing need not be burned - it can be reused after further aeration.
4. If chimney upper openings were covered, the seals should be removed carefully, otherwise there is

danger that the fires in ovens and fireplaces will not have enough draft and that carbon monoxide poisoning could result.

5. After the final all-clear a gassing report in the prescribed form should be completed, in two copies. In particular, it should include:
 - a) Volume of space gassed,
 - b) Quantity of Zyklon used,
 - c) Name of the gassing team leader,
 - d) Names of the other personnel involved,
 - e) Duration of treatment,
 - f) The date and hour of the final all-clear for the disinfested rooms.

XIV. Final all-clear:

1. Never before 21 hours after aeration was begun.
2. All objects removed for shaking out should be brought back.
3. Windows and doors should be closed for one hour.
4. Heated rooms should have their temperature restored to at least 15° C.
5. *Trace gas detection.* The paper strips should not be a brighter blue than the bright end of the reference color scale even between sheets or mattresses laid together, and in places difficult of access or difficult to aerate. If this is not the case, the aeration should be continued and *trace gas detection* should be repeated after a few hours.
6. In buildings in which people will soon sleep *trace gas detection* should be done in every room separately. *People should never sleep in a room that has been gassed the night following the gassing.* The windows should remain open the first night the room is in use again.
7. The leader of the gassing team or his deputy should not leave the building until the final all-clear has been given for the last room.

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